RADIAN CORPORATION

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REVISED AND RESTATED CLOSURE PLAN FOR BLOCK 5, ORIGINAL CITY OF AUSTIN, LOTS 7 THROUGH 12, AUSTIN, TEXAS (PHASE II SITE)

Prepared for:

Mr. Kevin Fleming, Lincoln Property Company

For Approval by the Texas Department of Health

Lincoln Properties
TXD 981155971
X Ref Vol 1

Prepared by:

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Austin, Texas

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CLOSURE PLAN CERTIFICATION

The Closure Plan for the Lincoln Property Company property (west tract of Block 5 of the original City of Austin) will achieve a "clean closure" of this site in accordance with the requirements of the Texas Department of Health when conducted using a detailed work plan to complete the required work. I, Wayne Calvin Smith, a Registered Professional Engineer in the State of Texas (Registration Number 63057) do hereby certify that this closure plan will achieve a "clean closure" of the Lincoln Property Company property.

Wayne Calvin Smith

Wayne Calvin Smith
P.E. No. 63057

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1.0 INTRODUCTION

Lincoln Property Company (LPC) is owner of the west tract of Block 5 of the original City of Austin (Lots 7-12) bordered by First Street to the south, Colorado Street to the west, Second Street on the north and an alley to the east. This tract is referred to herein as the Phase II Site. The east tract of Block 5 (Lots 1-6) is hereinafter referred to as the Phase I Site and is the location of the 100 Congress Office Building. A coal tar body, the source of contamination on Lots 1-12, was removed from the Phase II site in December 1986; however, soil and ground-water contamination still exist.

The "Closure Plan for the 100 Congress Avenue Site" (Radian Corporation, October 1986) briefly discussed Phase II closure activities as removal of all remaining contaminated soils from the Phase II site following excavation of the coal tar body. These activities were predicated upon the construction of a Phase II building. A revised and more detailed description of the closure plan for the Phase II site is described in this report since no immediate construction plans are anticipated.

The purpose of the closure activities on the Phase II site is to achieve a "clean closure" of the site by removing all contaminated soils, ground waters, and coal tar materials.

2.0 ADDITIONAL INVESTIGATIONS

Additional field investigations described in this section will be undertaken prior to commencing closure activities at the Phase II site. Based on the results of these activities, additional investigations beyond those scoped below may be necessary prior to soil excavation.

2.1 Soil Borings

A series of soil borings completed within the boundaries of the Phase II site will provide a way to classify soil during excavation and removal. By correlating results of laboratory analysis for soil samples with direct readings obtained for the samples by field monitoring equipment, a determination of the soil classification as contaminated or uncontaminated can be made as excavation progresses. Soil classification will determine the ultimate disposal method.

what kind of field monitoring equipment?

Boring Locations and Sampling Method

Initial field investigation will consist of soil boring and sampling at 15 locations to estimate the extent of soil contamination within site boundaries. The exact placement of boreholes will be determined at the time of drilling; however, as shown on Figure A-1, nine boreholes will be concentrated in the northern portion of the site since this area has been shown through previous subsurface investigations to be the most contaminated. The remaining six boreholes will be located throughout the central and southern portions of the site. If the initial borings are insufficient to determine the extent of contamination, additional locations will be chosen for boring and sampling. Boreholes will be advanced using a drill rig and hollow-stem auger.

Continuous samples will be obtained from the ground surface to bedrock. A CME continuous coring sampler will be used to characterize subsurface strata in five-foot intervals. Samples may be collected at any depth directly from the split-barrel sampler. All samples will be placed immediately into a 500-ml clear glass jar with teflon-lined lid. Each jar will be labeled with the borehole location/number, sample depth, and time and date of collection. In addition, field notes recorded in a log book will provide a description of soil through the entire depth of each borehole.

Field Testing

At the time of sampling, a portable flame ionization detection (FID)/photoionization detection (PID) gas chromatograph (GC) will be used to determine the total organic concentration of soil contaminants. Soil vapor samples will be collected with a soil probe and air sampling bag. Vapor samples injected into the portable unit will produce a chromatogram which can be compared to chromatograms from background samples to observe differences in relative peak heights and number of independent peaks. Interpretation by a qualified system operator will indicate relative degrees of contaminations in the soil. Portable GC units, run on AC power sources or battery, are manufactured by HNU Systems, Inc., and Shmidzu.

Field results will be documented in the log book. Chromatographs will be labeled with sample location and depth, and time and date of collection.

Laboratory Testing

Soil samples will also be submitted to the laboratory and analyzed for the constituents listed in Table B-1. The organic compounds shown are those previously detected in the coal tar body.

Correlation of Results

Results of the field and laboratory tests and all previous data will be used to estimate the quantity of contaminated soil and the degree of soil contamination present. As excavation proceeds, relatively uncontaminated soils can be used as daily cover at the municipal sanitary landfill as was the case during removal of the coal tar body. Contaminated soil will be transported to a TDH-authorized disposal facility.

The use of field monitoring during excavation based on results of this investigation will allow appropriate decisions to be made regarding soil disposal.

2.2 Background Water Quality Monitor Well Installation

Installation of several monitor wells located in areas away from known contamination (i.e., the Phase II site) will provide information on the concentration of constituents naturally occurring in soil and ground water. Establishing these background levels in soil and water will aid in the determination of (1) when clean closure has been achieved (i.e., removal of all contaminated soil) and (2) whether ground water collected after closure is contaminated. Statistical methods will be employed to compare actual concentrations in soil and water from the Phase II site to the background levels when assessing residual or potential contamination. However, the closure activities will achieve removal of all contaminated materials (any level above the detection limits for the parameters listed in Tables B-1 and B-2).

Three monitor wells will be installed during this effort. The exact placement has not been determined; however, wells will be generally located north, south, and west of the Phase II site. Well construction will be similar to the existing Phase II site monitoring wells. Soil samples will be collected during well installation and analyzed for the parameters listed in Table B-1. Laboratory results will provide information on background levels of contaminants in order to assess residual contamination existing on the Phase II site following soil excavation.

When monitor well construction and development is completed, ground-water samples will be collected once per month for six months to determine background water quality. Samples will be analyzed for the parameters listed in Table B-2. The parameters shown are identical to constituents previously detected in coal tar; however, the analytical methods for water differ. In addition, laboratory analysis will include a GC scan to detect the presence of any additional parameters beyond those listed in Table B-2. The background levels established will be used to determine if ground water collected within the Phase II site boundaries following soil excavation is contaminated, and to indicate the probable source of infiltrating water.

3.0 SELECTION OF CONTRACTORS

Prior to initiating on-site closure activities, a team of contractors will be assembled to address all aspects of the work required. This includes health and safety, excavation, geotechnical, transportation and disposal, and any subsequent construction activities which may be implemented. The contractor selection procedure includes issuing an identical request for proposal to qualified and experienced prospective bidders, submission of bids on a unit cost basis by contractors, and review of bids and selection of a contractor for each (or multiple) phase(s) of the work. Pre-bid submittal will include a list of projects and references that demonstrate adequate performance and at least two years experience in site closures.

Following the selection of contractors, all personnel expected to be on-site during handling of contaminated materials will require training in accordance with an approved Health and Safety Plan, meeting the latest OSHA standards.

4.0 CLOSURE PROCEDURES

The activities described in this section will be performed during and after closure to remove all contamination from the site and ensure that no contamination enters the site following the completion of closure activities. Re-contamination will be prevented through the use of a ground-water collection system. Criteria for clean closure will be to remove all soil with detectable levels of any of the parameters listed in Table B-1. The criteria for clean closure with respect to ground water will be to remove and properly dispose influent ground waters from the Phase II Site in accordance with regulatory requirements.

To what concentration level will removal be conducted?

4.1 Soil Removal

Excavation of soil within the Phase II site boundary will proceed in a manner similar to that used during construction of the Phase I building. The contractor may choose to use backhoes, front-end loaders, dump trucks, or other heavy construction machinery. A retaining wall will be installed as needed at vertical faces. Field testing will be performed as excavation proceeds to determine the disposition of soil. As previously stated, relatively uncontaminated soil can be used as daily cover at a municipal sanitary landfill, whereas contaminated soil must be transported to a TDH-approved disposal facility.

After contaminated soil has been removed, sampling will be performed to verify that no residual contamination exists. The parameters identified in Table B-1 will be used for laboratory analysis. Additional excavation will be undertaken if test results indicate contamination above detectable levels for any of the constituents listed in Table B-1.

4.2 Collection and Disposal of Ground Water During Soil Removal

It is anticipated that ground water will flow into the open excavation as soil removal approaches the depth of underlying bedrock. Therefore, dewatering procedures will be implemented. Infiltrating water will be collected and treated prior to discharge. An on-site carbon treatment system (separate from the Phase I system) will be used since its effectiveness has been proven through the operation of both a temporary and permanent treatment system for water collected from the Phase I building. However, if water collected from the Phase II site requires additional treatment, an appropriate system will be installed to meet regulatory requirements.

4.3 Collection and Disposal of Ground Water Following Soil Removal

Following soil removal, a ground-water collection system will be installed to prevent potentially contaminated water from flowing back into the Phase II site and contaminating any backfill material. A drainage and collection system will be designed and installed to collect ground water around the Phase II site. A perforated pipe laid in a trench backfilled with gravel, or the functional equivalent of such a system, will be used for drainage. A sump, located near a topographic low of the excavated area, will be used for collection. Collected water will be pumped to a reliable treatment system separate from the Phase I system. A secondary containment layer of low permeability material and a leak detection system will be installed to minimize the contamination of the backfilled material should the primary collection system fail. An impervious layer, sloped to promote drainage of runoff, will be installed at the surface to prevent infiltration of precipitation. Preliminary drawings illustrating these systems are shown in Figures A-2 and A-3. This scenario assumes that the excavation is backfilled with soil.

4.4 Post-Closure Monitoring

If the excavation is backfilled, a monitoring system will be required to ensure that the ground-water collection system functions properly. The monitoring system will consist of a well (or wells) installed at the low points in the leak detection system; the well will be checked on a weekly basis for occurrence of water. If water appears in the well, testing will determine whether the source is contaminated ground water from off-site, or precipitation which has leached through the backfill material.

5.0 ADDITIONAL CLOSURE ACTIVITIES

Several additional activities required to ensure the success of site closure are described in this section.

5.1 Safety

A special contractor will be selected to develop a Health and Safety Plan describing the protocol which must be strictly followed to protect all on-site personnel involved in closure activities, as well as the public. Of particular importance, the plan will include the following information:

1. Selection of adequate personal protective equipment;
2. Establishment of work zones;
3. Decontamination procedures;
4. Emergency response procedures;
5. A personnel training program; and
6. A medical monitoring program.

The contractor will designate and maintain an on-site Safety Director. His responsibility is to enforce the Health and Safety Plan by providing safety training to all personnel, supervising all necessary work place monitoring, and requiring all personnel who enter the site to wear appropriate protective clothing and follow all safety procedures.

5.2 Decontamination

Procedures will be implemented for decontaminating equipment leaving the site as part of a system to prevent or reduce the physical transfer of contaminants by people or equipment. Hand tools and vehicles used in the closure area, and personal protective equipment--boots, coveralls, respirators, etc.--will be considered contaminated and appropriately cleaned prior to removal from the site each day. All heavy machinery--backhoes, front-end loaders, dump trucks, etc.--will be decontaminated at the completion of site closure.

In general, decontamination of heavy machinery will consist of scraping off dirt clods, then steam cleaning followed by a thorough rinse with water. Smaller items will be washed with a detergent solution and rinsed with copious amounts of water. Dirt on tools and boots will be removed as much as possible manually, then washed and rinsed. Personal protective equipment will be either disposed or decontaminated upon leaving the site. Disposable suits and coveralls, gloves, etc., will be placed in a drum for off-site disposal.

All equipment requiring decontamination will be air dried. Soap and water will be readily available for use by personnel engaged in closure activities.

Decontamination procedures will take place in a pre-designated area. During closure, washwaters will be allowed to drain into the excavation and will be subsequently pumped through a treatment system. Washwaters resulting from the final decontamination of heavy machinery will be collected and treated prior to discharge.

5.3 Closure Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) procedures will be implemented to ensure that closure activities are conducted in accordance with detailed specifications to be prepared for the work. A registered professional engineer will be present to conduct inspections at critical stages of closure and will be available to certify the closure.

Duplicate samples of soil and ground water collected during closure activities will be submitted for independent verification of laboratory results.

5.4 Reporting

Site closure will be documented by compiling all records of the Safety Director, QA/QC inspection reports, and a chronological summary of events into a detailed report of site activities. All correspondence with regulatory agencies affecting approval of the closure plan and subsequent actions will also be included in the final report. The report will be certified by a registered professional engineer and submitted to the Texas Department of Health for acknowledgement that a clean closure has been attained for the Phase II site.

In addition to the report documenting closure activities, status reports will be prepared on a periodic basis to document findings, progress, and problems encountered during all phases of closure, and subsequent impacts on closure procedures or schedule. Copies of reports will be sent to regulatory agencies as required.

6.0 SCHEDULE

Approval of this closure plan by the Texas Department of Health, as well as review by the Texas Water Commission and the Environmental Protection Agency, Region VI, is required prior to implementing any activities described herein. The estimated time required for closure is twenty (20) months from the time of submittal for approval to completion of site activities. The various phases required included the following:

1. Submit the closure plan for review and approval;
2. Conduct additional site investigations;
3. Prepare plans and specifications for the work;
4. Submit plans and specifications for review and approval;
5. Select contractors;
6. Secure additional permits needed for the specific closure steps;
7. Perform on-site closure activities;
8. Prepare and submit documentation of closure.

The closure schedule is presented in Table B-3. This estimate of the duration of the closure activities is contingent upon timely receipt of review and approval at various steps. Also the actual excavation activities could be extended due to unforeseen circumstances such as underground obstructions, weather delays, or other factors beyond the control of LPC or its representatives.

APPENDIX A

Figures

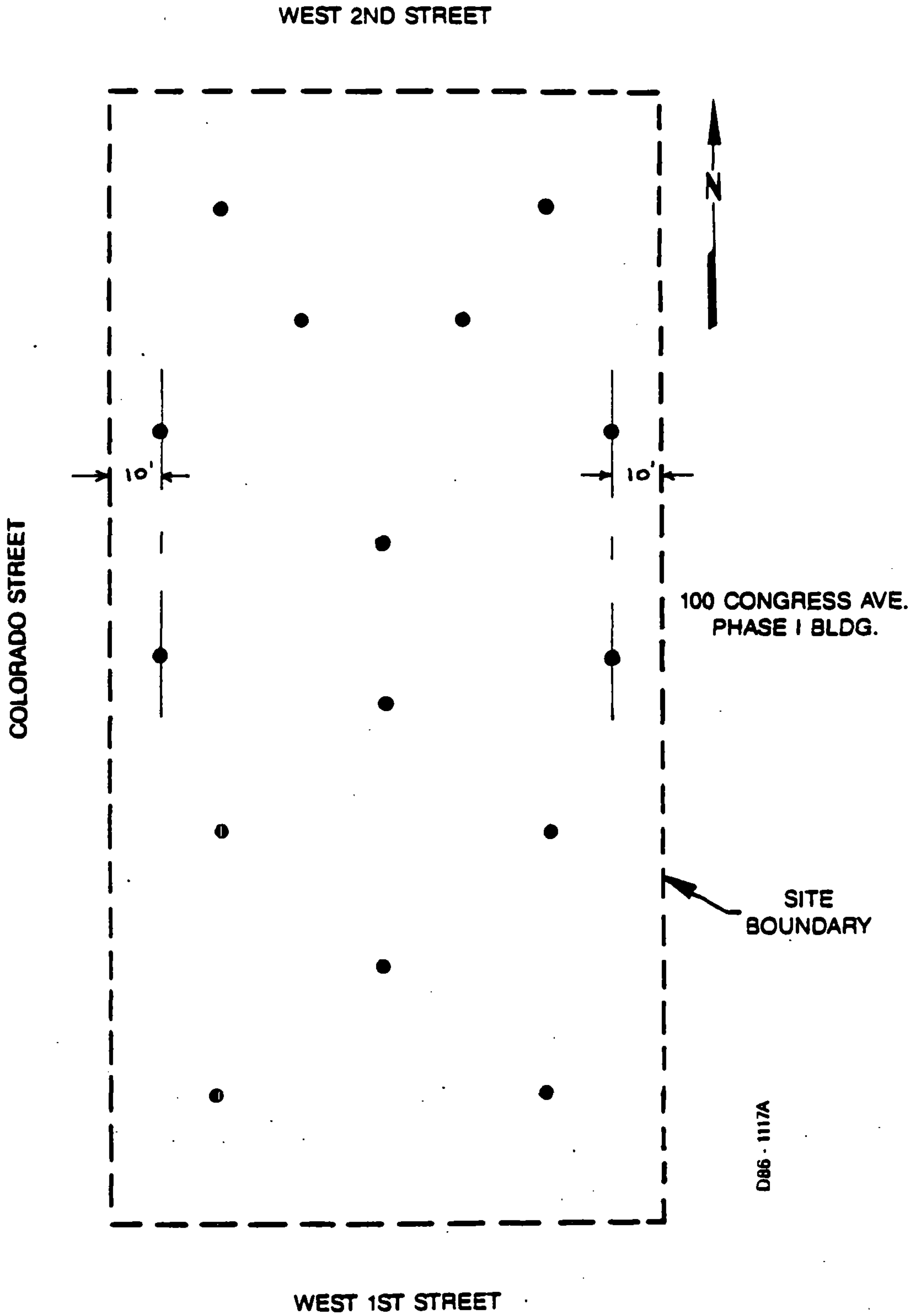

Figure A-1. Site Plan Showing Relative Location of Initial Soil Borings
(Drawing not to scale)

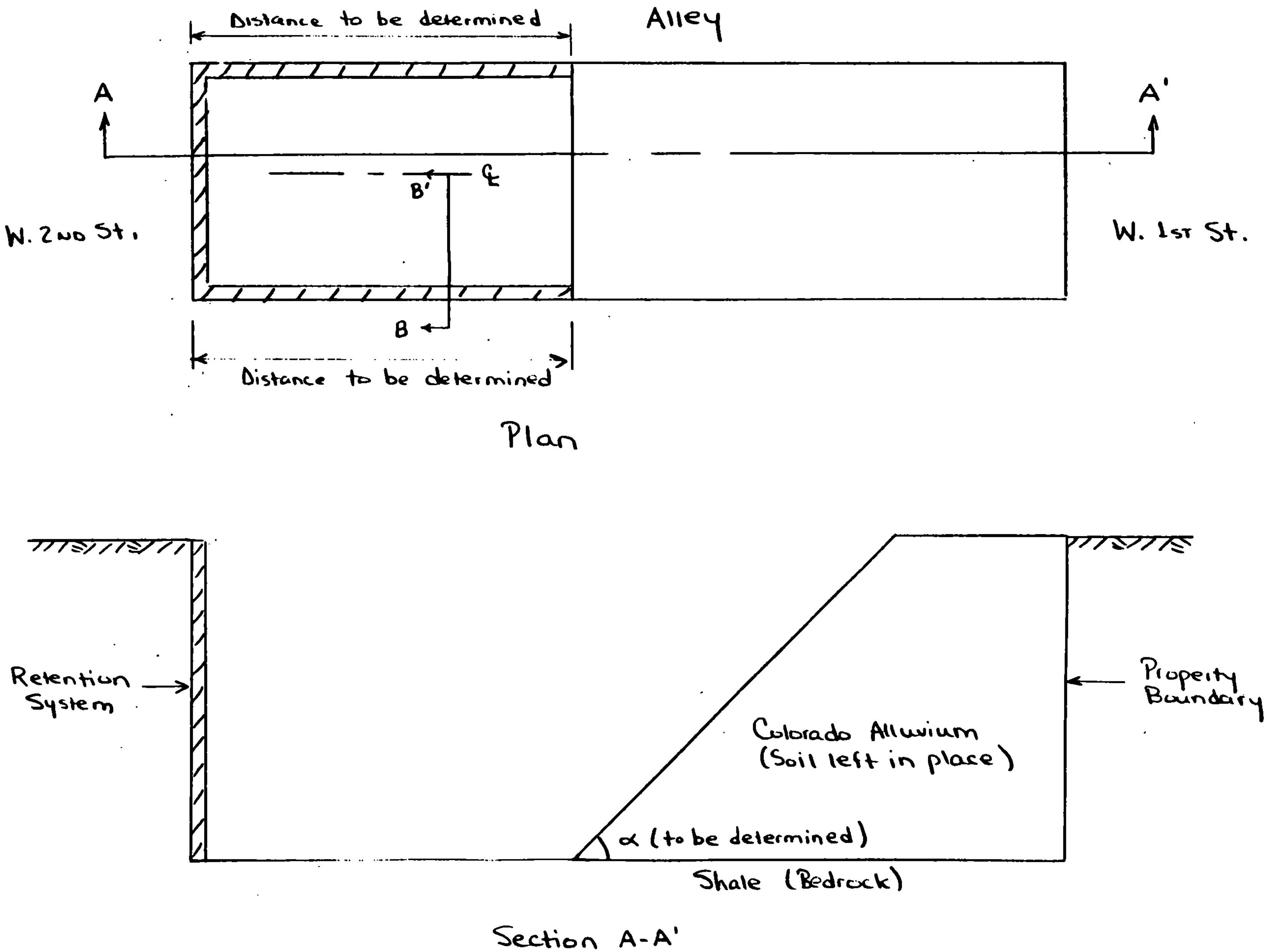

Figure A-2. 100 Congress Avenue Phase II Site Following Soil Removal

1. Maximum ground-water elevation--highest level of Town Lake since 1959--is approximately 433 feet above mean sea level.

2. External drainage/collection system consists of a 12-inch perforated pipe set in gravel. The pipe is sloped to a sump at the low point with a standpipe used to collect influent ground water.

3. Internal leak collection/detection system consists of a 6-inch perforated pipe set in gravel. The trench is sloped to a low point with a monitor well used to detect the presence of liquid.

4. The internal barrier wall extends to a height above the maximum ground-water elevation.

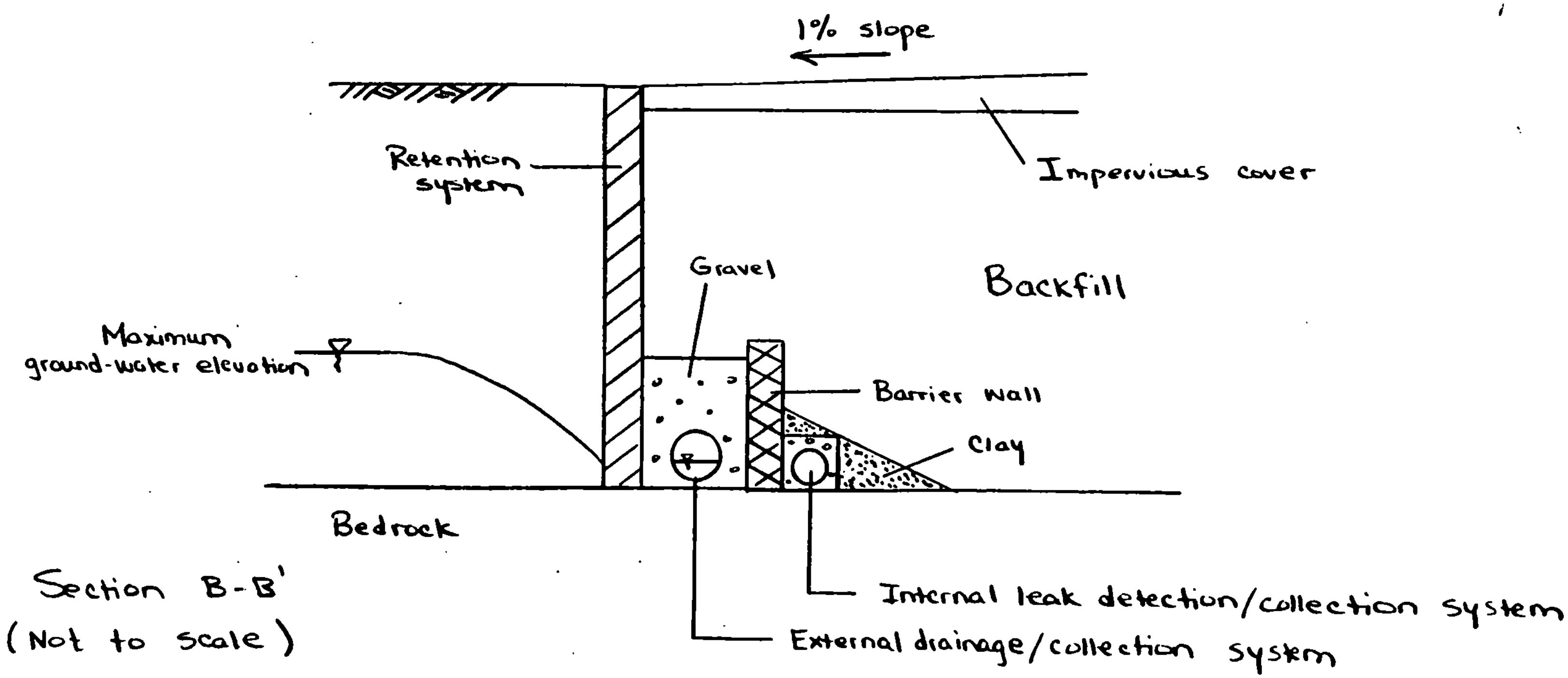

Figure A-3. Ground-water Collection System Installation Details

APPENDIX B

Tables

TABLE B-1. PARAMETERS AND ANALYTICAL METHODS FOR SOIL SAMPLES

Analytical Method	Compound	Estimated Detection Limit*
EPA Method 8240	Benzene	5.0 ug/kg
	Ethylbenzene	5.0
	Toluene	5.0
	m-xylene	5.0
	o, p-xylene	5.0
EPA Method 8270	Phenol	1.0 mg/kg
	2, 4-Dimethyl phenol	1.0
	Cresols (all isomers)	1.0
	Polyaromatic hydrocarbons:	
	Acenapthene	1.0
	Acenapthylene	1.0
	Anthracene	1.0
	Benzo (a) anthracene	1.0
	Benzo (a) pyrene	1.0
	Benzo (b) fluoranthene	1.0
	Benzo (g,h,i) perylene	1.0
	Benzo (k) fluoranthene	1.0
	Chrysene	1.0
	Dibenzo (a,h) anthracene	1.0
	Fluoranthene	1.0
	Fluorene	1.0
	Ideno (1,2,3-cd) pyrene	1.0
	Naphthalene	1.0
	Phenanthrene	1.0
	Pyrene	1.0

*Actual detection limits may vary with moisture content of soil samples.

TABLE B-2. PARAMETERS AND ANALYTICAL METHODS FOR WATER SAMPLES

Analytical Method	Compound	Detection Limit (ug/L)
EPA Method 620	Benzene	0.5
	Ethylbenzene	0.5
	Toluene	0.5
	m-xylene	0.5
	o, p-xylene	0.5
EPA Method 604	Phenol	1.0
	2, 4-Dimethyl phenol	1.0
	Cresols (all isomers)	25.0
EPA Method 610	Polyaromatic hydrocarbons:	
	Acenapthene	5.0
	Acenapthylene	5.0
	Anthracene	1.0
	Benzo (a) anthracene	1.0
	Benzo (a) pyrene	1.0
	Benzo (b) fluoranthene	1.0
	Benzo (g,h,i) perylene	1.0
	Benzo (k) fluoranthene	1.0
	Chrysene	1.0
	Dibenzo (a,h) anthracene	1.0
	Fluoranthene	1.0
	Fluorene	1.0
	Ideno (1,2,3-cd) pyrene	1.0
	Naphthalene	5.0
	Phenanthrene	1.0
	Pyrene	1.0

TABLE B-3. CLOSURE SCHEDULE

Activity	Duration	Start	End
Review and approval of closure plan	2	0	2
Additional site investigations	3	2	5
Prepare plans and specifications	3	5	8
Review and approval of plans and specifications	1	8	9
Select contractors	2	9	11
Secure additional permits	2	11	13
On-site activities	6	13	19
Final report	1	19	20